

Introduction

The Sonotec Sonoflow sensor has the option to output flow rate as a current and a frequency. For this application, we are using Sonoflow Model IL.52/3 v2.0. Other models in the Sonoflow line may be applicable as well, however, it is up to you to verify the outputs and appropriate scaling.

You can include the data from the Sonoflow sensor in your ECM CAN system by using the ECM cable P/N 10-55 and the ECM 10gpiCAN. We will reserve input channels 1 and 2 on the 10gpiCAN to read the current and frequency from the Sonoflow and send that data over CAN which can then be logged in the ECM Configuration Tool, ECM miniPEMS, or a third party CAN monitoring software of your choice.

This document will describe how to set up the ECM 10gpiCAN. It is very important to set up the 10gpiCAN BEFORE connecting the Sonoflow sensor.

Prerequisites

1. ECM 10gpiCAN Module
2. ECM Configuration Tool
3. ECM's Sonoflow Adapter Cable, P/N 10-55
4. Sonotec Sonoflow IL.52/3

Setting up the ECM 10gpiCAN

1. Connect the 10gpiCAN to the CAN bus and apply power.
Note: Do not connect the Sonoflow sensor until instructed to do so.
2. Open ECM Configuration Tool and click Start.
3. After all modules are initialized, select the 10gpiCAN in the Module drop down list.
4. Select "Set Up Inputs" in the Task drop down list, and click "Configure..." to open the configuration window.
5. Make sure the input channels 1 and 2 are configured as shown below. All other channels are still available for

other purposes.

Input Ch1 Configuration:

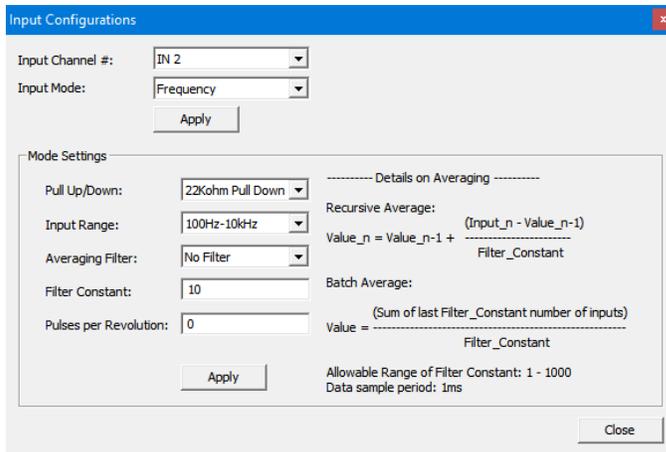
Input Mode = Current.

Click Apply.

Input Range = 4-20mA.

Click Apply.

The screenshot shows the 'Input Configurations' dialog box. At the top, 'Input Channel #' is set to 'IN 1' and 'Input Mode' is set to 'Current'. Below this is an 'Apply' button. The 'Mode Settings' section includes: 'Pull Up/Down' (dropdown), 'Input Range' (4-20mA), 'Averaging Filter' (No Filter), 'Filter Constant' (10), and 'Pulses per Revolution' (empty field). To the right of these settings is a 'Details on Averaging' section with the following formulas:
Recursive Average: $Value_n = Value_{n-1} + \frac{(Input_n - Value_{n-1})}{Filter_Constant}$
Batch Average: $Value = \frac{Sum\ of\ last\ Filter_Constant\ number\ of\ inputs}{Filter_Constant}$
At the bottom right of the dialog, it states: 'Allowable Range of Filter Constant: 1 - 1000' and 'Data sample period: 1ms'. There are 'Apply' and 'Close' buttons at the bottom.



Input Ch2 Configuration:
 Input Mode = Frequency.
 Click Apply.
 Pull Up/Down = 22Kohm Pull Down.
 Input Range = 100Hz-10kHz.
 Click Apply.

6. Close the Input Configuration window.
7. Connect Sonoflow Adapter Cable (P/N 10-55) to the grey connector of the 10gpiCAN.
8. Connect the M12 round connector on the other end of the adapter cable to the Sonoflow sensor.
9. You should see input values shown on the ECM Configuration Tool.

10. ***** IMPORTANT *****
 If using the Sonoflow sensor with the 10gpiCAN in a miniPEMS2 system, you must go through the "Setup miniPEMS" procedure in the ECM Configuration Tool. Instructions on pages 5-7 of the miniPEMS2 manual. If you do not do this, you will not see the Sonoflow sensor data in the miniPEMS2 log files.

Sonotec Sonoflow Configuration

As shipped from ECM, the following configuration has been applied:

1. Auto-zeroing: The Sonoflow is configured to auto-zero when flow is less than 30 ml/min for 5 seconds.
2. Current Output: 4-20mA represents 0-750 ml/min.

$$\text{Flow} = 46.875 * [\text{Current in mA}] - 187.5$$

An error state is indicated by current output of 2mA. No fluid (i.e. air) in sensor is one such error state.

3. Frequency Output: 300-10,000 Hz represents 0-750 ml/min.

$$\text{Flow} = 0.7732 * [\text{Freq in Hz}] - 23.196$$

An error state is indicated by current output of 150Hz. No fluid (i.e. air) in sensor is one such error state.

To change these configurations, use Sonotec's Flow Monitor Software and their included USB adapter. Refer to Sonotec's Quick Start Guide on how to use their software. The Flow Monitor Software and Quick Start Guide are available on their included thumb drive.

ECM ENGINE CONTROL
AND MONITORING

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ECM_AppNote2212011_10gpiCAN_with_Sonoflow.pdf